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THE HEALTHY HEART PROGRAM AT THE UNIVERSITY OF MONTANA: A
PROGRAM REVIEW

By

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Professional Paper

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Abstract—The Healthy Heart Program at the University of Montana: A Program Review

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Purpose: The purpose of this paper is to identify whether the Healthy Heart Program at the University of Montana is successful at facilitating lifestyle behavior changes. **Methods:** Six participants from Spring of 2015 were interviewed 3-4 months post and again 9-10 months post participation in the program. Interview questions focused on whether participants were working toward goals as well as their opinion of the program and what could be done to improve it. Additionally, 18 participants who took the Rand-36 quality of life questionnaire before the program were redistributed the questionnaire 9-10 months post after participation. Dependent t-tests were run for each dimension of the questionnaire.

Results: Participants reported making specific goals to improve their health as well as continuing to work toward those goals after 9-10 months. Suggestions were also made to contact subjects after participation in the program. No significant differences were found in any dimensions of the Rand-36.

Conclusion: The Healthy Heart Program shows some success at facilitating lifestyle behavior changes in participants. However, further research is needed to quantify successful behavior change. Furthermore, the participants would benefit from increased contact with students or professors to guide them through their behavior change process.

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Chapter 1: Introduction

The University of Montana's Healthy Heart Program is designed to educate Missoula residents about their health while allowing health and human performance students to apply the skills that they have learned throughout their undergraduate education. Clients undergo a free cardiac stress test, body fat composition, strength and flexibility assessment, and are tested for peripheral vascular disease. A lipid panel and fasted blood glucose levels are assessed. Prior to any testing clients complete a Rand-36 quality of life survey as well as a questionnaire regarding their eating habits, stress levels, and risk factors for heart disease. Students gather all information about their assigned client and ask their client what goals they would like to achieve in regards to their health. A portfolio is given to each client with their results, as well as a list of goals to work towards. For the most part, clients are tested in a single 2-hour period, and students meet with them separately at a later date to go over their portfolio and goals. Unless the client reaches out to their student leader or lead professor of the program, the student and client have no further contact or mechanism for assessing the success of the project.

Statement of Problem

Although this program provides individuals with knowledge regarding their health, it is unclear whether clients make an effort to change after the program. Students are not required to follow up with their clients, or vice versa. This raises the question of whether the program itself is effective at facilitating lifestyle behavior changes, an important reason for the program. The Healthy Heart Program encourages behavior change by setting goals for each client to reach, but does not provide accountability or follow-up to see whether these changes are being made. It is thus unclear which aspect of the program could have the most impact on whether clients choose to make lifestyle changes. It is possible, and in some cases demonstrated, that students have

tremendous impact on the client's perception of how to change their lifestyle habits. It is, however, unclear whether students give realistic goals to the clients and whether they communicate those goals to the client in a clear and effective way. It is also unknown if clients receive enough support after the program is over to maintain or reach their goals. A shortcoming of the Healthy Heart Program is that, without knowing whether clients are applying what they learned from participating in the program, it is difficult to tell which aspects of the program may need adjusting.

Purpose of Study

The purpose of this study is to evaluate the Healthy Heart Program at the University of Montana and assess whether it is effective at facilitating lifestyle behavior changes. From this information, we can attempt to adjust aspects of the program in order to make it more beneficial to the clients participating in the program.

Significance of Study

The Healthy Heart Program serves over 100 clients every spring. These clients are faculty at the university and residents of Missoula and its surrounding areas. Many have significant health issues that are discovered, such as coronary artery disease, diabetes, obesity, and high blood pressure. Clients rely on their student leader and staff to help guide them in living a healthier lifestyle. If the program is not, in doing so, changes need to be made in order to make the program beneficial for the client. This study aims to identify aspects of the program that can be changed or modified to make the program stronger.

Limitations and Delimitations

Some limitations to this research are that there is little internal validity. This makes it difficult to judge whether behavior change was directly due to the program intervention each

client received or whether other factors contributed to whether they chose to make lifestyle changes. I attempted to control for this during the interview process. My questions asked if any outside factors affected the clients' behaviors. Likewise, I asked if they felt the Healthy Heart Program made enough of an impact to influence them to make any changes. Another limitation is the data collection method. My primary method of gathering information is through interviews. Although this is an effective method to answer my question, there is very little quantitative data from these individuals to compare their responses with.

Delimitations to this study are my population of interest, the problem and purpose of my research, my methods in which I gather information, and the variable of behavior change that I am attempting to find.

Basic Assumptions

Throughout this research, I will assume that my subjects are honest with me during their interviews as well as those who are taking the Rand 36 Item Question Survey over again. I assume that my sample represents the population of those who participate in the Healthy Heart Program. I also assume that my subject population is homogenous with no substantial differences between them.

Research Questions

My research questions focus on the clients of the Healthy Heart Program. I would like to know whether clients set goals for themselves after participation in the program. I would also like to know if clients work toward their goals once the program is finished.

Chapter 2: Literature Review

INTRODUCTION

The Center for Disease Control ranks heart disease as the number one cause of death in the United States (Center for Disease Control, 2014) with over half a million deaths each year due to cardiovascular disease (CVD). Similarly, the World Health Organization categorizes CVD as the leading cause of death in the world (World Health Organization). Heart disease often comes with a number of co-morbidities such as obesity, high blood pressure, abnormal cholesterol, high blood glucose, and a high prevalence of Type 2 Diabetes Mellitus (T2D) (Alharbi et al., 2014; Spark et al., 2015). All of these risk factors and co-morbidities are preventable or manageable with lifestyle interventions.

Over a quarter of Americans engage in no leisure time physical activity. Coincidentally, over a quarter of American adults are categorized as being obese (Body Mass Index $> 30 \text{ kg/M}^2$) (Center for Disease Control) with a high overlap between the sedentary and obese populations. While a large portion of individuals with cardiovascular disease understand the need to reduce their risk factors and control their co-morbidities, many struggle to change their behaviors in order to improve their health (Alharbi et al., 2014). Several intervention programs have attempted to educate and facilitate lifestyle behavior changes to improve one's health such as the Diabetes Education and Cardiac Rehabilitation Program (D'Angelo et al., 2014; Martin et al., 2012; Unick et al., 2011). These programs, while generally successful at promoting short-term weight loss and healthy dietary habits, fail to sustain the behavior changes, and many individuals gain up to half of their weight back after one year and often return to their baseline weight within 3 to 5 years (D'Angelo et al., 2014; Martin et al., 2012; Spark et al., 2015). Much work remains

in the understanding of how to promote maintenance or healthy lifestyle changes and long-term maintenance of the derived changes. On a positive note, recent behavior change techniques have been combined with physical activity and diet changes to successfully attenuate weight gain post lifestyle interventions (Alharbi et al., 2014; D'Angelo et al., 2014; Folta et al., 2009; Hankonen et al., 2014; Lee et al., 2008; Martin et al., 2012).

The purpose of this paper is to gain a better understanding of the aspects of behavior change necessary to promote long-term adoption of healthy lifestyles in order to better serve the participants in the Healthy Heart Program at the University of Montana. Unlike current research, this program is considered a short-term intervention program. Participants receive their health evaluation and testing in a two-hour window and receive little, if any, follow up. The program is conducted by undergraduate students in a semester long course, making it difficult to create a long term, behavior change program. However, having a better understanding of how to facilitate long lasting behavior change could help create a more meaningful and life changing experience for both the participants and the students running the program.

This literature review evaluates current behavior change programs in both healthy and diseased individuals to obtain a better understanding of aspects of successful programs and how they might be incorporated into this program. Second, I will evaluate how self-efficacy affects individuals' ability to make healthy behavior changes and how to best measure this effect. Finally, this literature review evaluates the Rand-36 (Bosch et al., 1999; Gijssberts et al., 2015; Javinen et al., 2014; Weintraub et al., 2008; Zee et al., 1996), a quality of life survey used in the Healthy Heart Program, and to assess whether it is an appropriate tool to use for assessing participant needs.

The main goal of this paper is to provide feedback for the Healthy Heart Program on how to better serve participants. With this information, I hope to recommend the use of behavior change tools that will help students enact long-term behavior change with their participants.

BENEFITS OF LONG TERM BEHAVIOR CHANGE PROGRAMS

Little research exists studying the effects of short-term behavior change programs. This is primarily due to the fact that humans need to repeat a behavior several times before it becomes part of their daily or weekly routine (D'Angelo et al., 2014; Lee et al., 2008; Spark et al., 2015). Initially, individuals tend to lose weight and decrease their risk factors for heart disease and diabetes (Alharbi et al., 2014; Dunn et al., 1999; Fiocco et al., 2013; Folta et al., 2009; Martin et al., 2012; Spark et al., 2015). However, as time progresses and participants receive less communication with program leaders, progress decreases and many individuals fall back into old habits (Alharbi et al., 2014; D'Angelo et al., 2014; Martin et al., 2012; Spark et al., 2015). Greater contact with an individual leads to successful maintenance of a behavior change intervention (Martin et al., 2012; Spark et al., 2015). Research on behavior change interventions have varied from 12 weeks (Folta et al., 2009) to 24 weeks (Dunn et al., 1999). Folta et al. met for 1 hour, 2 times per week for 12 weeks with 96 middle aged women with a Body Mass Index (BMI) greater than 24. These sessions focused on physical activity and education on weight management and diet. After 12 weeks, Folta and colleagues measured significant decreases in body weight (BW), BMI, waist circumference, caloric intake, and increases in number of steps taken per day. After the 12-week intervention, these women were never followed up with, leaving it unclear as to whether they maintained their lifestyle changes. This research is important as it shows that behavior changes can occur in as little as 3 months with as little as 2

hours of intervention a week. However, it is generally accepted and supported that longer behavior change programs have greater success at maintaining lifestyle behavior changes (Balcazar et al., 2015; Dunn et al., 1999; Fiocco et al., 2013; Hankonen et al., 2014; Spark et al., 2015; Unick et al., 2011). Dunn and colleagues looked at 235 men and woman over a period of 2 years. Subject leaders first followed subjects very closely with meetings 2-3 times per week. As the intervention program progressed, subjects were met with bi weekly or monthly for updates. After 24 weeks, all subjects had significant increases in total energy expenditure and cardiovascular fitness as well as improvements in blood pressure, cholesterol levels, and body fat percentage (Dunn et al., 1999). Although contact was minimal in the final months of this intervention program, subjects continued to improve their overall health.

SELF-EFFICACY AND ITS EFFECT ON BEHAVIOR CHANGE IN THE DISEASED POPULATION

Self-efficacy is described as an individual's belief in his or her ability to perform a particular behavior in a variety of ways (Martin et al., 2012). Albert Bandura, the creator of the social-cognitive theory, emphasizes the importance of self-efficacy on the ability to change their behavior (Bandura, 1977). Recently, self-efficacy has become increasingly popular in predicting health behavior change (Henderson & Cole, 1992; Sarkar et al., 2009). Individuals with higher self-efficacy are more likely to pursue goals and persevere through setbacks, whereas those with low self-efficacy are less optimistic about their abilities to perform physical activities (Bandura, 1977, Bergstrom et al., 2014). In general, chronic disease has a profound effect on ones psychological status, which can affect adherence to a treatment program (Siennicka et al., 2015).

Assessing one's self-efficacy throughout treatment can be a helpful tool in predicting adherence to a behavior change program (Henderson and Cole, 1992).

Henderson and Cole looked at self-efficacy in both cardiac and respiratory patients undergoing cardiopulmonary rehabilitation. Each patient went through 8 weeks of cardiopulmonary rehab while a healthy control group exercised three times a week for 8 weeks. All participants filled out a Stanford University self-efficacy questionnaire where they rated their confidence to engage in activities or situations that may cause cardiopulmonary stress. After 8 weeks, there was a significant increase in physical self-efficacy with no difference in the control group. Cardiopulmonary patients also showed significant difference in their pre-post stress test scores (Henderson and Cole, 1992). Aside from assessing self-efficacy throughout treatment, self-efficacy can be used to predict overall adherence and success in patients with cardiovascular disease.

The Heart and Soul Study looked at 1024 patients with cardiovascular disease. Measurements of left ventricular ejection fraction (LVEF), stress test electrocardiogram (ECG), number of hospitalizations, quality of life, and self-efficacy were taken (Sarkar et al., 2007; Sarkar et al., 2009). Participants with lower self-efficacy had significant increases in hospitalizations and had lower baseline cardiac function (Sarkar et al., 2009). These individuals also felt they had greater physical limitations and a lower quality of life than those who had higher self-efficacy (Sarkar et al., 2007). Sarkar concludes that self-efficacy is as important as cardiac function in patients with cardiovascular disease (CVD) (Sarkar et al., 2007). Bergstrom and colleagues recorded the self-efficacy of 377 men and reported that individuals with low self-efficacy in their ability to perform physical activity had a higher incidence of cardiac events later in life (Bergstrom et al., 2014). This study highlights the importance of self-efficacy on

outcomes in the diseased population. Although both of these studies show the importance of self-efficacy, they do not explain how to address patients who have low self-efficacy.

Self-efficacy can be used to identify patients who may need extra attention or time throughout their treatment (Siennicka et al., 2015). Hankonen et al. (2014) looked at differences in behavior interventions in those who had recently been diagnosed with T2D. Diabetes treatment was provided to 478 patients, where they were educated on increasing physical activity and eating a low fat diet. Half were given various behavior change techniques (BCTs) to utilize throughout treatment. Those who had BCTs to use during their treatment reported higher levels of physical activity, METs per day, and weight loss. Specifically, the BCTs of goal setting and social support showed the strongest relationship in BMI reduction, whereas goal setting, goal review, and preparation for dealing with set backs were showed best results on eating low fat diets (Hankonen et al., 2014). Martin and colleagues interviewed 24 patients in the final phase of cardiac rehab that reported both goal setting and social support as important factors to increase adherence to cardiac rehab programs. Bandura describes mastery experience (being able to perform the activity), vicarious experience (learning from others), and verbal persuasion as important factors in increasing self-efficacy (Bandura, 1977). These specific characteristics have been found to increase self-efficacy, and therefore, exercise performance in individuals with CVD (Rajatl et al., 2014). Conclusively, many strategies can be used in order to increase self-efficacy in individuals with chronic disease (Bandura, 1977; Hankonen et al., 2014; Martin et al., 2012; Rajatl et al., 2014).

THE RAND-36 ITEM SURVEY AND ITS ROLE IN MEASURING QUALITY OF LIFE IN THE DISEASED POPULATION

Quality of life has become an increasingly useful way to measure outcomes of interventions in individuals with various diseases. Lower health related quality of life (HRQOL) scores are associated with individuals suffering from obesity, diabetes, and who smoke. These individuals generally spend 3 times the annual healthcare costs of those who have the highest HRQOL scores (Gijsberts et al., 2015). Therefore, it is important to use HRQOL questionnaires as a tool to monitor patient recovery.

The RAND-36 Item Survey (RAND-36) is a quality of life survey that measures eight dimensions of health: physical functioning, role limitations due to physical problems, role limitations due to emotional problems, vitality, emotional well-being, social functioning, pain, and general health (Bosch et al., 1999; Gijsberts et al., 2015; Javinen et al., 2014; Weintraub et al., 2008; Zee et al., 1996). Zee and colleagues validated the survey using 3000 randomly assigned individuals in the Netherlands and found the survey had alpha values between .71 and .90 (Zee et al., 1996). Zee emphasizes that this survey is non-disease specific, which allows one to compare results of people with various diseases. The RAND-36 has been used by a number of researchers authors to look at perceived quality of life in patients who have undergone various procedures for cardiovascular disease.

The Rand-36 has been used to study changes in quality of life for individuals who undergo Percutaneous Coronary Interventions (PCIs), also known as angioplasty (Bosch et al., 1999; Gijsberts et al., 2015; Weintraub et al., 2008). It has been found that prior to the intervention, patients have a much lower perceived quality of life than the general population with women having significantly lower scores than men (Gijsberts et al., 2015). However, post

intervention, there are significant improvements in all domains of the RAND-36 survey (Bosch et al., 1999; Weintraub et al., 2008). More invasive procedures, such as a coronary artery bypass graft (CABG), still show some improvements in physical functioning categories, however, level of improvement seem to be dependent on severity condition prior to CABG procedure (Javinen et al., 2014). Jarvinen et al. found that patients who underwent CABG procedures to prevent a heart attack maintained better quality of life scores 12 years post op than those who had a heart attack that lead to a CABG procedure.

THE BENEFITS OF CARDIAC REHABILITATION AND ADHERENCE TO EXERCISE

Cardiac rehabilitation (CR) is a relatively new form of treatment for cardiovascular disease. Cardiac rehabilitation involves coordinated, multifaceted interventions designed to optimize a cardiac patient's physical, psychological, and social functioning (Balady et al., 2000; Leon et al., 2005). Throughout this process, patients begin a regular exercise program and receive nutritional counseling as well as education on how to manage various risk factors associated with cardiovascular disease such as hyperlipidemia, hypertension, diabetes, obesity, and smoking cessation (Alharbi et al., 2014; Balady et al., 2000; Leon et al., 2005; Marchionni et al., 2003). CR programs are an effective way to stabilize, slow, or reverse the progression of atherosclerosis, and patients who attend CR are less likely to be re-hospitalized due to cardiac complications (Bock et al., 2003; Leon et al., 2005; Niebauer et al., 1997). Research also supports adherence to a lifestyle program once CR is finished (Alharbi et al., 2014; Bock et al., 2003; Marchionni et al., 2003).

Bock and colleagues looked at 132 patients who had either completed only Phase II of cardiac rehab (G-1), had completed both Phase II and Phase III (G-2), or those who were

currently in Phase III (G-3). All patients consented to release their medical records and filled out a 7-day activity recall. They also reported their perception of changes in exercise habits. There was a significant difference increase in reported moderate and vigorous activity in G-2 and G-3 patients than G-1 patients. G-3 patients recorded significantly more minutes per week of activity than G-1 patients. Overall, G-2 patients were more likely to engage in vigorous exercise and meet CDC/ACSM guidelines for health. Attrition rates for this group were reported at 27% compared to 70% of the G-1 group (Bock et al., 2003). This research supports the idea that adherence to a CR program supports longer lasting lifestyle changes, than those who fail to comply with a CR program.

The elderly population is largely underrepresented in studies involving cardiac rehabilitation (Leon et al., 2005; Marchionni et al., 2003; Williams et al., 2002). Many factors play into the lack of participation in an older population. Octogenarians represent 20% of MI hospitalizations and 30% of MI deaths, however, it is thought that angina goes undetected due to a lack of physical activity among this population (Williams et al., 2002). This population may be less mobile or have issues with transportation if the CR facility is farther away (Marchionni et al., 2003; Williams et al., 2002). Marchionni et al. studies the effects of a cardiac rehabilitation program on the elderly population compared to other age groups. 270 individuals who had an MI were placed into 3 different age groups (45-65, 66-75, or 75+). From there, individuals were placed in a CR program at a hospital (Hosp-CR) for 40 sessions, an at home CR program (Home-CR) that was self-monitored, or a control group (CG). Total work capacity (TWC) and health related quality of life (HRQOL) was measured at baseline, 2 months, 6 months, and 12 months post CR program. There was a significant increase in TWC in both intervention groups as well as an increase in TWC in the very old age group for both interventions. Age group 45-65 in the

Hosp-CR intervention maintained TWC above baseline over the entire study, whereas the other age groups returned toward baseline at 6 and 12 months. Home-CR TWC remained higher than baseline throughout for all age groups. HRQOL improved significantly in both treatment groups. This research suggests that CR enhances exercise tolerance post MI in patients of all age groups. However, 2 months of treatment may be too short of a time to obtain optimal physiological benefits for all age groups.

Although research shows that CR benefits individuals who participate, cardiac rehabilitation is still underutilized (Balady et al., 2000; Leon et al., 2005; Williams et al., 2002). With only 10-20% of the more than 2 million people eligible for CR services attending, most researchers attribute this to low referral rates from physicians, lack of recognition of the importance of CR, low motivation, and geographic limitations to program site (Balady et al., 2000; Leon et al., 2005; Williams et al., 2002). To make matters worse, 50% of patients fail to maintain regular participation in physical activity 1 year after their CR program (Bock et al., 2003). With all the benefits that cardiac rehabilitation has to offer, it is important to continue to educate physicians, patients, and loved ones of how cardiac rehabilitation could benefit them.

Chapter 3: Methodology

Research Design

Research was directed toward other programs that involve both exercise interventions as well as health education. I also researched studies in which long and short-term interventions are conducted and behavior change is assessed. Finally, I've assessed how the Rand 36 quality of life survey has been used in past research and its validity in research.

Subject Recruitment

Recruitment for Interviews

Students who performed their testing for the Healthy Heart Program recruited participants for this study. Students were asked to give two names of their clients who they thought would be willing to participate and who needed to make some lifestyle behavior changes. They also wrote down the goals that they gave their clients to work on. Subjects were contacted via email and by phone to ask if they were willing to participate in two interviews asking them about their experience with the program immediately after testing and 6 months post program testing.

Recruitment for QOL Assessment

All clients who participated in the program fill out the Rand-36 quality of life survey as part of their new client paperwork. I redistributed the survey via electronic mail to those individuals asking them to participate. I then compared previous scores to current scores and assessed whether any changes had been made since.

Data Collection Procedures

Interview Data Collection:

Subjects were invited to meet at a location convenient to them. Subjects were asked about their individual goals and how whether they had started working toward those goals. They were also asked about the program itself and whether they thought the program had benefited them. I compared what the clients said their goals were to what the students gave to me to make sure that there was no error in student/client communication.

Chapter 4: Results

Subject Demographics

Of the subjects participating in interviews, 4 were males and 2 were females. All but 1 male participant finished the interview process. All interviewees were faculty or staff at The University of Montana.

The Rand-36 Quality of Life survey was redistributed to twenty-six of the Healthy Heart Program Participants. Of the twenty-six, thirteen were males and thirteen were females. Of the 26 surveys, 18 were returned, consisting of 10 males and 8 females.

Interview Questions

Interviews were conducted in June and July of 2015. Follow up interviews were performed January of 2016. Each interview section consisted of 6 questions pertaining to the client's goals, progress in reaching these goals, and their opinions on the Healthy Heart Program. Interviews were conducted in person at the University of Montana campus at a location of the subjects choosing. Both interviews were held in the same location as the first.

Interview 1 (See appendix A)

Question 1—What motivated you to sign up for the Healthy Heart Program?

All subjects reported some interest in their health with some intention to make changes. One individual reported already having cardiovascular disease, and another subject reported having family history of heart failure.

Question 2—Did you work with your student group on specific goals to improve your health?

All subjects reported receiving at least one goal to work towards. Some reported as many as three goals. The goals reported to me were checked with what the students had reported. Five of the six subjects reported at least one matching goal with their lead student. Half of the subjects matched two or three goals. Only one client reported goals that were not listed on the student's list of goals.

Question 3—Have you started working on any of these goals?

Half of the subjects reported already having started working toward at least some of their goals. 2 subjects stated that they were already very active, and felt that they just needed to add their goals into their current routine. Half of the subjects had not started working toward their goals. Lack of time and being out of town were reasons for not working toward their goals. 1 subject stated she had not started yet, but planned to soon.

Question 4 –What have you been doing in order to achieve these goals?

The 3 individuals who have started working towards their goals all report adding activities into their daily routine. These individuals were working toward improving their physical health and reported making small adjustments in order to add extra activity.

Question 5—On a scale of 1-10 (1=no confidence, 10=absolutely sure) how confident are you in your ability to achieve these goals? Why?

Reported numbers to this question were 5, 7, 8, 9, 9, and 10. Subjects who reported 5 and 8 reported time being a big constraint on whether they accomplish their goals. The subject reporting 7 felt that he needed a more disciplinary system to hold him accountable. Individuals who reported 9 and above felt they needed to incorporate more into their routine, but did not think it would be an issue.

Question 6—Would you sign up for this program again? Why or why not?

All subjects stated they would sign up for the program. Everyone felt they were given helpful information and that it was valuable to improve their health. Many would like to repeat the program to see any changes that have been made from their lifestyle changes.

Interview 2 (See appendix B)

The second round of interviews took place in the same location as each client's first location. Clients were contacted via electronic mail. One client was dropped from the interview process after attempting to contact him twice to set up an interview date.

Question 1—Have you begun working toward the goals that your student gave you?

All five subjects reported having started working toward their goals. Most clients were focused on one main specific goal. Two of the five had been working on two or more of their goals. One client stated he began working on calisthenics and HITT training, but felt they were causing injury.

Question 2—(If yes to 1) How often do you implement these goals into your weekly routine?

How many weeks have you been implementing these changes?

All subjects, with the exception of one, stated they implemented their changes 4-5x/week. Two of the clients focused on changing physical activity habits, while the other two made changes to both physical activity and dietary habits. The one subject who was not implementing his behavior change into his routine was not doing so due to his belief that the exercises were causing him injury.

Question 3—Do you feel any environmental factors have affected your ability/inability to incorporate these behavior changes into your life?

All subjects stated that time is their biggest barrier to maintaining their lifestyle changes. Three of the subjects mentioned weather (cold/ice in the winter and smoky summers) as a challenge to completing their physical activity. One client stated that he was already very active and fitting more activities into his routine was difficult, but he associated this with having too little time.

Question 4—On a scale of 1-10 (1 = not at all, 10 = completely influenced) how much of an influence did the Healthy Heart Program have on your decision to make / not make behavior changes?

Reported numbers to question 4 were 4, 5, 7, 7, and 8. The lower two scores were given due to the fact that these subjects were already very active and did not need much guidance in maintaining a healthy lifestyle. Both stated that the program did help motivate them to work harder.

Question 5—Was there anything about the program that you think could be adjusted to better serve you as a client? (specific tests, explanation of results, interaction with students, etc.)

Two of the 5 clients stated the program was sufficient as is. One subject reported that sometimes he felt the students were confused about what they needed to do. Another subject suggested additional follow-ups and adding more tests. The last critique stated that there was a lot going on during the treadmill test (asking questions, getting data, etc.), and that was a little overwhelming at times.

Question 6—Are there any other comments / critiques about the program that you would like to inform me of?

All clients reported that the program was great and very informative. Subjects stated the information was helpful and felt that there was value in the program.

Rand-36 Item Quality of Life Survey

Dependent t-tests were run for every category in the Rand-36 survey. No significant differences were found in any category from each subjects test date to 6 months post.

Chapter 5: Discussion and Conclusion

The Healthy Heart Program at the University of Montana has been one of the most popular programs in the Health and Human Performance Department. With over one hundred participants in the spring, professors constantly look to improve the program to fit the client's needs. The results from this study provide valuable information on ways to further improve the program in the future as well as foster ideas for further research ideas to better improve the program.

Discussion of Results

The findings of this study suggest that The Healthy Heart Program at the University of Montana appears to be successful at helping to facilitate healthy lifestyle changes in those who participate in the program. All subjects interviewed reported setting specific goals to work on after the program. Even those who were currently physically active wanted to work on some aspect of their health. After six or seven months, subjects continued to work toward at least one goal that they had previously set. All subject felt that the program was a valuable asset not only to themselves, but to the students, faculty, and department. The most common suggestion for improvement of the program was continuation of contact with subjects once the program was finished. Suggestions for improvement are discussed below.

Program Recommendations

Program Length and Behavior Change Techniques

Although the Healthy Heart Program does not have the capacity to create a 2 year long intervention program, I believe it is possible to maintain contact with those who participate in the program to provide encouragement and educational tools for the remainder of the year. Monthly follow-ups with a professor or graduate student may help hold someone accountable as well as

continue receiving tools that may help them make further gains in their health. However, this requires a large amount of time from students and professors and may not be realistic for a long-term solution. Therefore, it is important to look at behavior change techniques and what we could do during the testing period to give individuals the best chance they have to modify their lifestyle. This can be done through student interacting with their clients. Students can discuss certain behavior change techniques with their clients in order to better ensure long lasting behavior change. Some of these strategies, such as goal setting, goal review, and dealing with setbacks may be helpful in implementing healthy behavior changes in the participants of the Healthy Heart Program and would be fairly simple to explain in the post intervention meeting with their student leader.

Another solution to remain in contact with clients would be to allow graduate students or undergraduate seniors to take an independent study focused on this aspect of the program. They would be

Rand-36 Item Quality of Life Survey

Although no significant differences were found in any category of the Rand-36 survey, I still believe the program could benefit from using a quality of life survey. Clients filled out the quality of life questionnaire, but students rarely use this survey as part of their client analysis. I believe a survey that is easier to score and that can be utilized by the students to assess their client's issues could be beneficial to the client's overall. The Short Form-8 (SF-8) questionnaire provides a single question from each of the categories from the SF-36. This form has been validated by Roberts and colleagues (2008), and would be easy for students to score and interpret.

Additional Resources

The Healthy Heart Program provides clients with immediate feedback about their health. However, one of its weaknesses is the lack of follow up or encouragement after the program has finished. This is partially due to lack of time for both students and professors, and the fact that many of the students graduate from the program and are finished with the course. One of the biggest benefits this program could offer is additional resources to use after the program ends.

There are many local resources available in Missoula. The first programs are the Men's and Women's Heart Health program at the International Heart Institute. These programs are at low cost and help prevent or manage existing cardiovascular disease. High risk clients could utilize these programs immediately after testing. These are just a few cost effective programs that could be offered to clients.

Optimal Bear on the University of Montana campus provides health counseling by community health students in the Health and Human Performance Department. Students who work for Optimal Bear go through extensive training on behavior change and techniques to successfully change behaviors. Although this option is not free, I believe it would be possible to offer a few free sessions as a trial run in order to get people signed up and interested in the program.

A similar option would be to attempt to offer a free month at the University of Montana Recreational Center or a few free sessions with a personal trainer. This option would be most expensive in the long run, but would be convenient for the clients who are staff and faculty on campus. By giving clients multiple options, they are able to choose a program that best fits their needs physically and financially.

Limitations to the Study

Although successful results were found, limitations to the study may have prevented getting a full picture of how impactful the Healthy Heart Program could be. First was the number of subjects and recruitment method of these subjects. The number of subjects interviewed was very small. A larger number of subjects would give more insight to the program and what it needs for improvement. When recruiting these subjects, I specifically asked students for subjects who needed to make some sort of behavior change. This creates a bias in the subject population. The Healthy Heart Program does not keep any records of their clients, making it difficult to pick out a population that would benefit most from the program (i.e. moderate to high risk individuals). Further studies could request to keep records in order to randomly select participants who are at higher risk for developing heart disease.

As with the subjects interviewed, there was also a small number of subjects in those who were redistributed the Rand-36 questionnaire. Without a larger number of subjects, it is difficult to find significance over such a short period of time. Longitudinal data analysis of the Rand-36 would better portray how the Healthy Heart Program affects quality of life.

Conclusion

The Healthy Heart Program at the University of Montana offers successful, accurate testing for those at risk for cardiovascular disease. Most clients receive beneficial information in regards to their health and are encouraged to maintain or better their life through positive behavior change techniques. Without change, the program would continue to be successful for many clients. However, as behavior change becomes an increasingly prevalent issue to maintain a healthy lifestyle, it is important that adjustments are made to further benefit the clients. Therefore, continued quantitative and qualitative research on a larger number of clients would be

beneficial in explaining how clients can benefit from the program after making lifestyle behavior changes and could help narrow down which techniques are most valuable in facilitating healthy behavior change.

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Appendix A

Interview 1 consisted of the following 6 questions:

1. What motivated you to sign up for the Healthy Heart Program?
2. Did you work with your student group on specific goals to improve your health etc.
3. Have you started working any of those goals?
4. What have you been doing in order to achieve these goals?
5. On a scale of 1-10, (with one = no confidence, 10= absolutely sure) how confident do you feel in your ability to achieve these goals? Why?
6. Would you sign up for this program again? Why or why not?

Appendix B

Interview 2 consisted of the following 6 questions:

1. Have you begun working toward the goals that your student gave you?
2. (If yes to 1) How often do you implement these goals into your weekly routine? How many weeks have you been implementing these changes?
3. Do you feel like any environmental factors have affected your ability/inability to incorporate these behavior changes into your life?
4. On a scale of 1-10 (1 = not at all, 10 = completely influenced) how much of an influence did the Healthy Heart Program have on your decision to make / not make behavior changes.
5. Was there anything about the program that you think could be adjusted to better serve you as a client? (specific tests, explanations of results, interaction with students, etc).
6. Are there any other comments / critiques about the program that you would like to add or inform me of?